



# Improving the Medicare Advantage Program

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## Statement of

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#### Before the

Subcommittee on Oversight and Investigations Committee on Energy and Commerce U.S. House of Representatives The Medicare Payment Advisory Commission (MedPAC) is a congressional support agency established by the Balanced Budget Act of 1997 (P.L. 105–33) to provide independent, nonpartisan policy and technical advice to the Congress on issues affecting the Medicare program. The Commission's goal is to pursue Medicare policies that ensure beneficiary access to high-quality care, pay health care providers and plans fairly by rewarding efficiency and quality, and spend tax dollars responsibly. The Commission would like to thank Chair DeGette and Ranking Member Griffith for the opportunity to testify at this hearing today.

### Introduction

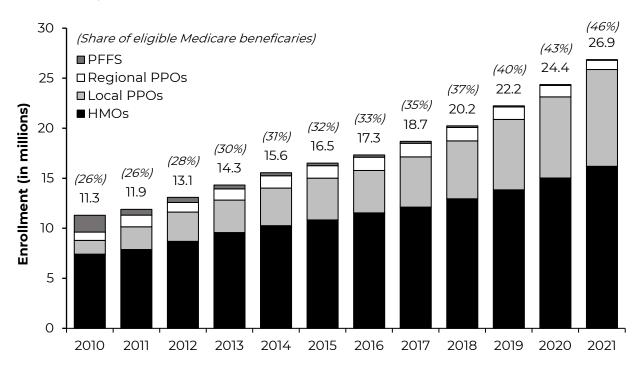
The Medicare Advantage (MA) program allows beneficiaries enrolled in both Part A and Part B of Medicare to receive benefits from private plans rather than from the traditional fee-for-service (FFS) Medicare program. Because of the way Medicare pays Medicare Advantage plans, they have greater incentives than FFS providers to innovate and use care management techniques to deliver more efficient care. Unlike FFS, these private health plans receive risk-adjusted capitated payments per enrollee determined in part by a "bid" submitted by the plan, to provide Part A and Part B coverage and pay health care providers for health care goods and services furnished to their enrollees. MA is funded through a combination of the Hospital Insurance (Part A) Trust Fund and the Supplementary Medical Insurance (Part B) Trust Fund, just like traditional FFS Medicare.

The Commission strongly supports including private plans in the Medicare program and allowing beneficiaries to choose between MA plans and traditional FFS. MA plans offer more affordable care for beneficiaries and have the potential to reduce overall Medicare spending. MA plans typically have more flexibility to adopt payment models and care management tools (e.g., capitation and prior authorization) than traditional FFS Medicare. For example, they can negotiate payment arrangements with individual providers, use care-management techniques that fill potential gaps in care delivery (e.g., programs focused on preventing avoidable hospital readmissions), and develop robust information systems that provide timely feedback to providers. Plans can also provide incentives for beneficiaries to seek care from more efficient providers (e.g., in-network referrals), offer integrated Part D drug benefits and extra benefits not covered by FFS (e.g., preventive dental care), and give beneficiaries more predictable cost sharing (e.g., flat copayments for certain types of services).

Plan participation and beneficiary enrollment in the MA program are quite robust. In 2021, the program included 4,778 plan options offered by 186 managed care organizations. In 2022, 99 percent of all MA-eligible beneficiaries have a health maintenance organization (HMO) or local preferred provider organization (PPO) plan operating in their county of residence, and the average beneficiary has more than 30 plans available in their county. Enrollment has grown by 10 percent per year over the last several years and has doubled since 2010 (Figure 1). Last year, 46 percent of eligible beneficiaries (about 27 million people) were enrolled in MA plans, and Medicare paid plans an estimated \$350 billion (not including Part D drug plan payments). If this trend continues, the majority of eligible Medicare beneficiaries will be enrolled in MA in the next few years.

<sup>&</sup>lt;sup>1</sup> Plans can receive separate payments from the Part B trust fund for providing Part D drug benefits.

Figure 1. Enrollment in Medicare Advantage has more than doubled over the last 10 years



Note: PFFS (private fee-for-service), PPO (preferred provider organization), HMO (health

maintenance organization). Beneficiaries must have both Part A and Part B coverage to be eligible for enrollment in a Medicare Advantage plan; therefore, beneficiaries who have Part A

only or Part B only are not included in this figure.

Source: MedPAC analysis of CMS enrollment files, July 2011–2021.

Beneficiaries clearly find MA an attractive option through which to receive their Medicare benefits, as evidenced by the program's strong enrollment growth. Plans whose bids to provide Part A and Part B covered services are lower than the local benchmark receive rebate payments, much of which must be used to provide extra benefits to plan enrollees. Many plans use rebates to finance lower cost sharing compared to FFS, and by law annual out-of-pocket costs are capped for MA enrollees. Medicare payments to MA plans have increasingly been used to finance extra benefits for enrollees, such as worldwide emergency care, routine eye exams, and fitness benefits. From 2019 to 2022, payments for these extra benefits increased by 53 percent, and now average nearly \$2,000 annually per enrollee, an all-time high (Medicare Payment Advisory Commission 2022a). These types of extra benefits can help attract enrollment in MA plans, although information about how these benefits are utilized is unknown to the Medicare program, and evidence is lacking about how effective those benefits are in terms of improving quality and health outcomes.

# **Concerns about Medicare Advantage**

Despite its growing popularity, the expansion of MA is also a cause for concern. Private plans that accept full risk have been available in Medicare since the mid-1980s, but they have never generated aggregate savings for the program, at least in part because of how they are paid, among other factors. We estimate that in 2022 Medicare payments to MA plans equal about 104 percent of what Medicare would have spent on those same beneficiaries in traditional FFS. The higher payments for beneficiaries in private plans, combined with growing enrollment in MA, are major factors driving growth in Medicare spending and putting financial pressure on the Medicare program.

Medicare's trustees estimate that without changes to current law, the Part A trust fund—which accounts for about 39 percent of total Medicare spending—will become insolvent in 2028 (Boards of Trustees 2022). The trustees also project that spending on Part B benefits will increase from about 48 percent of total spending to 52 percent in 2031.<sup>2</sup> The Part B trust fund is financed through a combination of beneficiary premiums and general revenues so it cannot become insolvent, but growth in Part B spending increases beneficiary premiums and consumes a growing share of general tax revenues. Since Medicare spends more to cover beneficiaries in MA than it would have in FFS under current policies, the shift toward MA worsens Medicare's sustainability and makes the need for structural improvements to MA more urgent.

The Commission contends that under the right policies, MA plans could serve as vehicles to manage spending and quality of care more effectively than the fragmented FFS system. Although MA plans have the potential to provide good value for the program, the policies that govern how MA plans are paid and administered are deeply flawed and prevent that value from materializing.

Today's testimony will focus on three areas where the Commission contends current MA policy is falling short and needs to be changed: (1) how MA plans' diagnostic coding practices inflate their Medicare payments; (2) the program to incentivize and reward plan quality increases plan payments for nearly all enrollees but does not provide the Medicare program, policy makers, or beneficiaries with the necessary information to evaluate plan quality; and (3) plan-submitted data about beneficiaries' health care encounters are incomplete.

Over the past few years, the Commission has made recommendations that address all three of these areas. These recommendations, which are explained in greater detail below, are intended to encourage efficiency and innovation, reduce the potential for overpayments to MA plans, and help policymakers evaluate and compare MA plans to FFS.

# **Coding intensity**

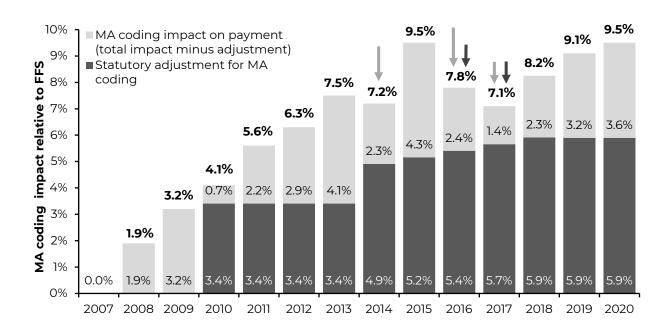
Medicare payments to MA plans are enrollee-specific, based on a plan's payment rate and an enrollee's risk score. Plan payment rates are based in part on county-level benchmarks, which are determined by each county's per capita spending for beneficiaries in FFS. Plan payments are adjusted by each enrollee's risk score, which accounts for differences in expected medical expenditures, and are based in part on clinical diagnoses. In general, more qualifying diagnoses yield greater Medicare payments to the MA plan. Most claims in FFS Medicare are paid using procedure codes, which offer little incentive for providers to record more diagnosis codes than necessary to justify providing a service. In contrast, MA

<sup>&</sup>lt;sup>2</sup> The remaining spending is for Part D drug benefits and on administrative costs.

plans have a financial incentive to ensure that all possible diagnoses are submitted to CMS, including those that are not being treated by a health care provider.

A Commission analysis of 2020 data shows that higher diagnosis coding intensity resulted in MA risk scores that were about 9.5 percent higher than scores for similar FFS beneficiaries. By law, CMS makes an across-the-board reduction to MA risk scores to make them more consistent with FFS coding, and although CMS has the authority to impose a larger reduction than the minimum required by law, the agency has never done so. In 2020, the adjustment reduced MA risk scores by 5.9 percent, resulting in MA risk scores that were on net about 3.6 percent higher than they would have been if MA enrollees had been treated in FFS Medicare (Figure 2). MA plans' higher coding resulted in an estimated \$12 billion in unwarranted payments to plans in 2020 (Medicare Payment Advisory Commission 2022a). The payments generated by excess coding allow plans to attract enrollees by offering more benefits without necessarily taking steps to reduce costs or improve quality. Because Medicare spends more for an enrollee in MA than it would have spent had that beneficiary remained in FFS, robust growth in MA is driven, at least in part, by these extra benefits, which contributes to Medicare's financial sustainability problem.

Figure 2. Impact of coding intensity on MA risk scores was larger than coding adjustment, 2007–2020



MA (Medicare Advantage), FFS (fee-for-service). All estimates account for any differences in age and sex between MA and FFS populations. Annual adjustment for MA coding began in 2010. MA coding intensity increased MA risk scores by about 1 percentage point annually but was offset by new risk adjustment model versions in 2014, 2016, and 2017 (gray arrows) and by increased FFS coding in 2016 and 2017 (black arrows).

**Source:** MedPAC analysis of CMS enrollment and risk score files.

Two practices are primarily responsible for the higher coding intensity among MA plans: diagnoses collected from health risk assessments (which rely on unverified enrollee-reported data), and use of medical chart reviews (a practice that does not exist in FFS Medicare). MA plans frequently initiate health risk assessments to collect information about beneficiaries' health status, health risk, and activities of daily living. Some MA plans spend significant resources calling enrollees, offering incentives to have them participate in health risk assessments, and sending nurses to enrollees' homes to conduct health risk assessments. We estimate that the diagnoses supported only by a health risk assessment—where no treatment was provided during the year—accounted for about 1 percentage point to 2 percentage points of overall excess MA coding intensity.

Chart reviews are intended to fully document the diagnoses made during hospital and physician encounters in which medical services were provided. MA plans use chart reviews to identify diagnoses that were indicated in a medical record but not recorded on a medical claim. Because Medicare requires each condition used to calculate beneficiary risk scores to be supported by diagnostic evidence in a patient's medical record, medical record reviews are a logical way for plans to identify diagnoses not captured through provider claims or on plan encounter data. Some plans and vendors appear to

selectively review charts with a higher likelihood of increasing revenue and use artificial intelligence to more accurately identify likely revenue-producing charts (Optum 2020).

In a recent study, the Office of Inspector General (OIG) found that in 2017, health risk assessments and chart reviews accounted for \$9.2 billion in payments to MA plans (Office of Inspector General 2021). Based on their findings, we estimate that health risk assessments and chart reviews generated 4.6 percent of total payments to plans and were responsible for nearly two-thirds of MA coding intensity in 2017 (Medicare Payment Advisory Commission 2022a).

In 2016, the Commission recommended a three-pronged approach to fully mitigate the impact of MA plan coding practices on Medicare spending (Medicare Payment Advisory Commission 2016):

- develop a risk-adjustment model that uses two years of diagnostic data instead of just one year (this would make the FFS diagnostic data more complete and reduce the marginal benefit for MA plans of coding additional diagnoses);
- exclude any diagnoses that are documented only on a health risk assessment; and
- apply a coding adjustment that eliminates any remaining difference in coding between FFS Medicare and MA plans.

Although MedPAC did not formally recommend excluding chart reviews from risk adjustment, doing so would be consistent with the Commission's approach to addressing coding intensity by eliminating the underlying causes of coding intensity to the extent possible.

# **Quality bonus program**

By statute, since 2012, Medicare's quality bonus program (QBP) provides higher payments to MA plans rated 4 stars or higher. The 5-star rating system, which predates the QBP, is also the basis of information that beneficiaries receive about MA plan quality through the Medicare.gov Plan Finder website and is intended to help beneficiaries compare plans and make informed selection decisions.

With almost half of eligible beneficiaries now enrolled in MA plans, it is imperative that beneficiaries be able to compare MA and FFS quality, and to compare the quality of the plans available in their area. However, meaningful comparisons between MA and FFS quality are not feasible because the data sources needed to compare MA with traditional FFS at the local market level are too limited. Choosing between MA and FFS is a threshold choice that beneficiaries make before getting to the step of deciding among available MA plans. Unfortunately, MA star ratings are obfuscated by measures that lack value and are based on data from geographically dispersed areas that do not provide meaningful information about the quality of care that providers furnish in beneficiaries' local area. Policymakers also need better information on the quality of care to monitor MA and FFS performance, including complete encounter data, which we discuss in the next section.

The Commission has identified several flaws in the QBP and the star rating system. First, the QBP uses too many quality measures, and many of them are process measures rather than measures that focus on outcomes and patient/enrollee experience. Second, the star ratings are determined at the MA contract level, which may cover very large geographic areas. Thus, star ratings are often an unreliable indicator of the quality of care provided in an individual's local area. This problem has been exacerbated by plan sponsors consolidating contracts to artificially improve their star ratings, an issue that has been partially addressed by legislation. Third, it is not clear that the current mechanisms for accounting for

the differences in the social risk of enrollee populations are effective. Plans serving high-needs populations are less likely to receive bonus payments. Fourth, bonus payments made under the QBP are financed with additional dollars above and beyond the cost of providing the Medicare benefit, in contrast to some FFS quality incentive programs that are funded by withholds of provider payments. We estimate that CMS will pay out between \$11 billion and \$12 billion in QBP bonus payments in 2022 (Medicare Payment Advisory Commission 2022b).

Despite the billions of dollars being spent on quality bonuses, fundamental flaws in the way quality is being measured and reported means there is no meaningful way for policymakers or beneficiaries to compare MA plans to each other, compare the quality of care among plans with FFS Medicare, or measure changes in quality of MA plans over time. These flaws need to be addressed before informed judgments can be made about whether MA is delivering high-quality, value-driven care for beneficiaries enrolled in private plans and taxpayers who finance the program.

Some observers may contend that since few beneficiaries change between MA plans or switch from MA to traditional FFS Medicare that quality among most plans must be adequate. There are several reasons to believe this logic is flawed. Research has shown that once patients select a health plan, they are usually reluctant to voluntarily switch to another plan, even if an alternative plan might better suit their needs (Sinaiko et al. 2013, Rivera-Hernandez et al. 2021, Jacobson and Neuman 2016). Beneficiaries may remain in suboptimal plans because their usual sources of care may not contract with other plans, their existing plan may offer extra benefits they cannot find elsewhere, or the large number of available plans creates a complexity of choices (e.g., extra benefits are not standardized) and a greater burden to reconsidering plan options.

Beneficiaries in an MA plan also have the option of switching to FFS Medicare, but moving from MA to FFS can have negative financial implications for many beneficiaries. Plans may use their rebate payments to finance lower cost sharing, lower premiums, or extra benefits, such as worldwide emergency care, routine eye exams, and fitness benefits. And unlike traditional Medicare, current law limits total annual out-of-pocket spending (\$7,750 in 2022) for beneficiaries enrolled in MA plans. Beneficiaries in traditional Medicare may purchase a supplemental insurance policy—known as Medigap—to reduce cost sharing and limit annual out-of-pocket costs, but these policies can be costly, with typical premiums ranging from \$150 to around \$200 per month (Koma et al. 2021). Furthermore, in most cases, beneficiaries who want to switch from an MA plan to FFS and purchase a Medigap policy can be denied a policy if they have a pre-existing health condition or may be subject to higher premiums due to medical underwriting. Thus, the fact that few beneficiaries switch from MA to FFS Medicare is less likely to be driven by MA plans' quality of care than the result of the lack of availability of Medigap policies, differences in total out-of-pocket costs, and the value of Medicare-subsidized extra benefits available to MA enrollees that are not included in the FFS benefit package.

In its June 2020 report, the Commission, recognizing that the current quality program is not achieving its intended purposes and is costly to Medicare, recommended that the Congress replace the QBP with a Medicare Advantage value incentive program that would:

<sup>&</sup>lt;sup>3</sup> With limited exceptions, federal law does not require insurers to issue community rated (i.e., an individual's health status is not factored into premiums) Medigap policies after the initial 6-month enrollment period when a beneficiary turns 65 years old and becomes enrolled in Medicare Part B.

- Score a small set of quality measures tied to clinical outcomes as well as patient/enrollee experience measures.
- Evaluate quality at the local market level to provide beneficiaries with information about the quality of care in their local area and provide MA plans with incentives to improve the quality of care provided in every geographic area.
- Account for differences in enrollees' social risk factors so plans with higher shares of enrollees with social risk factors are not disadvantaged in their ability to receive quality-based payments.
- Finance the MA quality system in a budget-neutral manner to be more consistent with Medicare's FFS quality payment programs, which are either budget neutral (financed by reducing payments per unit of service) or produce program savings because they involve penalties.

#### **Encounter data**

In 2012, CMS began collecting detailed information about each encounter an MA enrollee has with a health care provider, and plans are now required to include information about all items and services provided to MA enrollees. MA plans submit two types of records: (1) encounter records of health care items and services provided to enrollees, and (2) chart review records for information collected during a review of a patient's medical record or chart. These data are submitted using a standard claim format and, with some exceptions, include the same information as traditional Medicare's FFS claims. Plans are not required to submit encounter records about extra benefits not covered by FFS Medicare when a plan's payment for those services does not use a standard claim format. This limitation applies to many of the extra benefits offered by plans, including dental and ophthalmological services—another reason Medicare knows so little about the utilization and value of these extra benefits.

One of the ways that CMS uses encounter data is to calculate risk scores for each MA enrollee. CMS previously used diagnostic data collected through the Risk Adjustment Processing System (RAPS) to calculate risk scores and used a blend of both data sources from 2016 through 2021. The Commission has strongly supported calculating MA risk scores entirely on encounter data for a number of data integrity reasons (Medicare Payment Advisory Commission 2020), and starting in 2022 encounter records became the sole data source used for diagnostic information among MA enrollees.

In addition to risk adjustment, the Commission has long been interested in using MA encounter data to gather information about MA plan practices and utilization that can then be used to inform Medicare policies, either by informing improvements to MA payment policy, providing a useful comparator with the FFS Medicare program, or generating new policy ideas that could be applied across the entire Medicare program. For example, using encounter data as the basis for measuring MA plan quality would allow for more consistent quality measurement between MA and FFS and could provide an additional incentive for MA plans to submit complete encounter data. More comprehensive encounter data could also shed light on questions about whether lower service utilization patterns observed in many plans is the result of effective care management strategies or restrictions on needed care, and how differences in utilization are related to health outcomes. In addition, such data could provide more rigorous oversight for the nearly one-half of Medicare beneficiaries receiving their benefit through an MA plan and greater assurance that taxpayer money paid to MA plans each year is spent appropriately.

Policymakers also need better information on the quality of care to monitor MA performance, evaluate MA payment policy, and assess other elements of the MA program such as network adequacy. MA plans

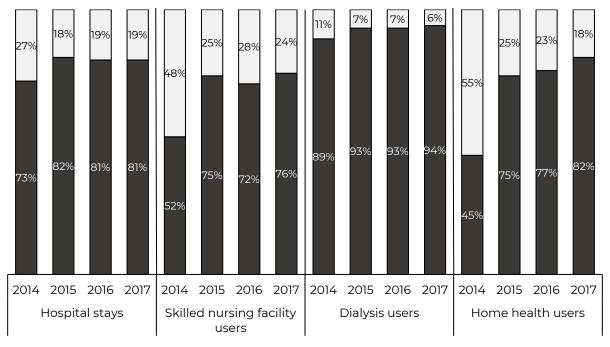
have a number of management tools that are not available in FFS but could improve the quality of care for their enrollees when used appropriately—tools such as selective contracting, care management, information systems shared across providers, and utilization management that can prevent overuse of potentially harmful care. These tools give MA the potential to improve quality relative to FFS, but a lack of sufficient data about how these tools are being used severely limits any definitive comparisons between MA and FFS Medicare.

To assess the completeness of encounter data, MedPAC conducted analysis of encounter records submitted by the two largest types of MA plans (PPOs and HMOs) for 2014 through 2017 (Medicare Payment Advisory Commission 2020). We conducted this analysis by comparing encounter data to external data sources (i.e., collected from sources other than MA plans, such as duplicate "no pay" claims and assessments submitted to CMS by health care providers) of MA service use where comparable records exist. We were able to make comparisons for beneficiaries who had inpatient hospital stays, who used skilled nursing, who were dialysis users, and who used home health services by attempting to match external data sources to MA encounter records for the same service.<sup>4</sup> Although the share of stays or users reported through the external sources that matched MA encounter records increased between the 2014 and 2017 period, the number of non-matching records remained high.

Between 2014 and 2017, the share of total hospital inpatient stays that had a matching encounter record grew from 73 percent to 81 percent (see Figure 3), which translates to nearly 800,000 inpatient stays that were recorded in the non-MA data source but were missing in the 2017 encounter data. Over the same period, the share of MA enrollees with an external record who also had encounter record for the same service increased from 52 percent to 76 percent for skilled nursing users, 89 percent to 94 percent for dialysis users, and 45 percent to 82 percent for home health users (Medicare Payment Advisory Commission 2020).

# Figure 3. Share of services reported in external data sources with matching encounter records, 2014-2017

<sup>4</sup> We cannot compare the majority of physician and outpatient hospital encounter data with an external data source because there is no available alternative source of physician and outpatient hospital utilization information for MA enrollees.



■ Matching external and encounter record

□ External record only

**Note:** External data sources are as follows: Medicare Payment Analysis and Review (MedPAR) for hospital inpatient stays; Minimum Data Set (MDS) for skilled nursing facility users; risk adjustment indicators for dialysis users; Outcome and Assessment Information Set (OASIS) for home health users. Encounter data include encounter records and chart review records. Chart review records can either be associated with and provide additional information about an encounter record or be unlinked to any other records.

**Source:** MedPAC analysis of CMS data.

Despite these improvements, MA encounter data still lack sufficient completeness and accuracy needed to compare MA utilization patterns to FFS Medicare, assess the quality of MA plans, and conduct program oversight. Given the promise and potential value of encounter data to the program, the Commission has recommended that the Congress direct the Secretary to establish thresholds for the completeness and accuracy of MA encounter data and:

- rigorously evaluate MA organizations' submitted data and provide robust feedback;
- concurrently apply a payment withhold and provide refunds to MA organizations that meet thresholds; and
- institute a mechanism for direct submission of provider claims to Medicare administrative contractors
  - o as a voluntary option for all MA organizations that prefer this method, and
  - as a requirement starting in 2024 for MA organizations that fail to meet thresholds or for all MA organizations if program-wide thresholds are not achieved (Medicare Payment Advisory Commission 2019).

# Conclusion

The Commission has long supported giving Medicare beneficiaries the option of having their care delivered by private plans through the MA program. MA has the potential to deliver a high level of value to Medicare beneficiaries and the program at-large. With the right set of payment policies and program oversight, private plans can offer more affordable care for beneficiaries while spending less than the traditional FFS program, and while still providing extra benefits to MA enrollees. However, evidence suggests that MA is not meeting this potential, which is especially concerning since almost half of beneficiaries are now enrolled in an MA plan. Given its rising share of spending and growing strains on Medicare's fiscal sustainability, the Commission contends that action is urgently needed to address flaws in the MA program. The recommendations I have discussed today would take important steps to curb coding practices that increase costs to taxpayers and beneficiaries, strengthen incentives for plans to provide high-quality care, and make it easier for beneficiaries and policymakers to evaluate what they are getting from the MA program.

### References

Boards of Trustees, Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds. 2022. 2022 annual report of the Boards of Trustees of the Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds. Washington, DC: Boards of Trustees.

Jacobson, G., Neuman, T. 2016. *Medicare Advantage plan switching: Exception or the norm?* Washington, DC: Kaiser Family Foundation.

Koma, W., Cubanski, J., Neuman, T. 2021. *A snapshot of sources of coverage among Medicare beneficiaries in 2018.* Washington, DC: Kaiser Family Foundation.

Medicare Payment Advisory Commission. 2016. *Report to the Congress: Medicare payment policy.* Washington, DC: MedPAC.

Medicare Payment Advisory Commission. 2019. *Report to the Congress: Medicare and the health care delivery system.* Washington, DC: MedPAC.

Medicare Payment Advisory Commission. 2020. *Report to the Congress: Medicare and the health care delivery system.* Washington, DC: MedPAC.

Medicare Payment Advisory Commission. 2022a. *Report to the Congress: Medicare payment policy.* Washington, DC: MedPAC.

Medicare Payment Advisory Commission. 2022b. *The Medicare Advantage program: status report and mandated report on dual-eligible special needs plans.* Washington, DC: MedPAC. https://www.medpac.gov/wp-content/uploads/2021/10/MA-status-MedPAC-Jan22.pdf.

Office of Inspector General, Department of Health and Human Services. 2021. Some Medicare Advantage companies leveraged chart reviews and health risk assessments to disproportionately drive payments. Washington, DC: OIG.

Optum. 2020. A smarter retrospective risk adjustment program. Eden Prairie, MN: Optum.

Rivera-Hernandez, M., Blackwood, K.L., Moody, K.A. 2021. Plan switching in Medicare Advantage: A qualitative interview with Medicare Advantage beneficiaries. *Medical Care Research and Review.* 78(6): 693-702. (December). doi:10.1177/1077558720944284

Sinaiko, A.D., Afendulis C.C., Frank, R.G. 2013. Enrollment in Medicare Advantage plans in Miami-Dade county: Evidence of status quo bias? *The Journal of Health Care Organizations, Provision, and Financing*. 50(3) 202-215. DOI: 10.1177/0046958013516586